

references and in further view of U.S. Patent No. 5,636,098 to Salfelder et al. ("Salfelder"), and the MatWeb reference entitled "Overview - Silicone, RTV, Adhesive/Sealant Grade" (the "third MatWeb reference") and the MatWeb reference entitled "Overview - Epoxy Adhesive" (the "fourth MatWeb reference"); claims 8-11 and 18 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Bloomfield et al. in view of Salfelder et al., in view of the first, second, third and fourth MatWeb references, and further in view of U.S. Patent No. 6,080,503 to Schmid et al. ("Schmid"); claims 1, 4-6 and 17 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Bloomfield et al., in view of Salfelder et al., in view of the first, second, third, and fourth MatWeb references in view of Schmid, and further in view of U.S. Patent No. 4,804,451 to Palmer ("Palmer"); and claims 7, 12 and 16 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Bloomfield et al., in view of Salfelder et al., in view of the first, second, third, and fourth MatWeb references in view of Schmid, in view of Palmer, and further in view of U.S. Patent No. 5,328,816 to Tamura et al. ("Tamura").

The present invention provides fuel cells and their methods of manufacture. The fuel cells include one or more of three different mechanisms by which a polymer electrolyte film is securely adhered to a frame. The mechanisms include, the polymer electrolyte film having a water content of not greater than 4, an adhesive having a modulus of elasticity of not greater than 10 MPa after cure, and/or an adhesive having a durometer A hardness of not greater than 90 after cure. These three mechanisms have been found by Applicant to prevent the seal between the polymer electrolyte film and the frame from deteriorating. Applicant has found that the seal can deteriorate if excess water is present in the polymer electrolyte film or if the adhesive is too hard.

Applicant respectfully traverses these rejections for the following reasons.

The Examiner cites one or more MatWeb documents in each of the pending rejections. However, there is no date identified in the documents indicating when this particular material was available on the MatWeb site. In response to a telephone inquiry, the Examiner indicated that it was his belief that the MatWeb site was first available in November or December of 1996, however, no confirmation action of this assertion has been placed into the record, nor is any information available as to when the specific pages, cited by the Examiner, were available. In view of this, Applicant submits that the citation of the MatWeb documents is improper and each of the rejections of claims 1 and 4-19 should be withdrawn.

In addition, the rejection of claim 15 should be withdrawn because one of ordinary skill in the art would not have been motivated to combine Salfelder with Bloomfield. Salfelder relates to seals for electrostatic chucks as compared to Bloomfield, which relates to electrochemical cells. These two references are directed to two entirely different arts and one of ordinary skill in the art of fuel cells would not have been motivated to consider or combine the disclosure of Salfelder with Bloomfield. Therefore, the Examiner's argument that Salfelder teaches "conventional" materials used to adhere two objects together misses the point--mainly, why would one of ordinary skill in the art have considered Salfelder at all, since Salfelder has nothing to do with fuel cells.

In view of this lack of motivation to consider, let alone combine, Salfelder with Bloomfield, the rejection of claim 15 is improper.

The rejection of claims 1, 4-7, 12, and 16-17 should also be withdrawn. The Examiner cites Palmer as teaching that bonds between frames and membranes are weak when the membrane surfaces are wet. However, Palmer is directed to a non-analogous art -- a deionization apparatus used to purify a liquid, wherein the chemical and thermal

environments and chemical processes are distinctly different from those of the present invention. Accordingly, one of ordinary skill in the art would not have looked to Palmer's purification apparatus for solutions to the thermal and chemical environment concerns solved by the present invention. Thus, the Applicant believes the citation to Palmer to be contrary to the rule, discussed in MPEP § 2143.01, that the mere fact that references *can* be combined does *not* establish a *prima facie* case of obviousness where there is no "suggestion or motivation in the reference to do so." MPEP § 2143.01 (citing *In re Mills*, 916 F.2d 680, 16 USPQ2nd 1430 (Fed. Cir. 1990)).

In addition, Palmer teaches away from the present invention. The portion of Palmer cited to by the Examiner, column 1:47-61, is further discussed in column 1:62 to column 2:45, wherein Palmer suggests *adhering an intermediate layer* between the membrane and the frame to enhance bonding strength, rather than relying on an improved adhesive selection and seal moisture management. This is in direct contrast to the claimed invention, where adhesive selection and limiting the water present in the membrane solves the problem identified by Applicant, preventing the seal between the film and frame from deteriorating.

The Examiner also cites Tamura as teaching "two substrates laminated together with adhesive containing spacer beads of a uniform particle diameter." However, as with Salfelder, Tamura is directed to an entirely different field of art than that of the claimed invention to which one of ordinary skill would have not referred. Tamura is directed to a process for making optical recording mediums, for example, where a protective layer substrate and a recording layer substrate are adhered together with spacers present to form an "air-gap type" recording medium. Tamura's optical media "air-gap" invention has nothing to do with the present invention, where formation of air-gaps is *not* desired. Thus, there is no

reason why one of ordinary skill in the art would consider Tamura, much less combine the disclosure of Tamura with the other cited references.

Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that the presently pending claims are in condition for allowance and issuance of a Notice of Allowance for claims 1 and 4-19 is respectfully requested.

The Examiner is invited to contact the undersigned to discuss any matter concerning this application.

The Office is authorized to charge any underpayment or credit any overpayment to Kenyon & Kenyon Deposit Account No. 11-0600.

Respectfully submitted,

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